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ENTOMOLOGICAL NEWS

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Collecting and Culturing of Native Wood Roaches in Ohio, with some Additional Notes on their Parasites

By LAFE R. EDMUNDS,[1] Department of Zoology and Entomology, The Ohio State University, Columbus, Ohio

In a previous paper (Edmunds, 1952a), the results of studies made during 1950–51 on the parasites and habits of wood roaches were described. These studies were continued through 1952, and numerous additional parasites of wood roach egg capsules were obtained. A method was also developed for the collecting and culturing of wood roaches. Information on this method together with data on the parasites is summarized as follows.

COLLECTING AND CULTURING WOOD ROACHES

Collecting. *Parcoblatta pensylvanica* (De Geer) and *Parcoblatta virginica* (Brunner) can be found in the wooded areas of Ohio at almost any season of the year. Cultures of wood roaches can be started from adults or nymphs collected in their natural habitats which include old buildings, wood piles, stacks of lumber, and the loose bark of dead trees.

Wood roaches will usually run rapidly when the cover under which they are resting is removed by the collector. The small roach nymphs can be picked up with an aspirator, but the larger

[1] Ass't Sanitarian, Communicable Disease Center, Public Health Service, Federal Security Agency, Mitchell, Nebraska. This work was done while the author was a Graduate Assistant, Department of Zoology and Entomology, The Ohio State University.

nymphs and adults must be caught with a pair of tweezers or the fingers. During the winter and early spring the overwintering nymphs cannot run very rapidly due to the cold, and this is a good time to collect them.

Rearing Procedure. When wood roaches have been collected they can be reared in large glass battery jars (Fig. 1). The bottom of each jar is covered with about an inch of wood shavings to absorb waste and moisture. To keep the roaches from escaping from these jars, the sides are greased with vaseline, and the top is covered with cheese cloth held in place by a strong rubber band. Strips of bark 2 inches wide and 4 inches long can be cut from a dead tree, and several pieces placed one above the other in the jar. The bark provides excellent cover and a natural resting place for the roaches.

Wood roaches were found to feed readily on commercial dog biscuits which come prepared in the form of pellets. A small dish of these pellets can be kept in the culture jar and replenished every 2 weeks. Commercially prepared rabbit foods were not suitable.

Water was supplied by using a small plastic dish with a tight fitting lid. A hole was drilled through the lid and a roll of dental cotton inserted through the hole so that 2 inches projected into the dish, and one-half inch projected out through the hole. When the dish was filled with water the dental cotton acted as a wick, and provided a constant supply of water.

The wood roaches thrive at temperatures between 70° and 80° F. and humidity of about 75%. The humidity was maintained near this level by placing the culture jars in a closed cabinet containing a pan of saturated salt water.[2] A pan 2 inches deep and 6 inches square filled with saturated salt solution maintained a humidity between 70–75% in the closed cabinet.

The female wood roaches drop the oothecae without attaching them. These capsules are scattered in the debris on the floor of the jar. At 1-week intervals these unhatched egg capsules can be collected by sifting through the debris, and they can be placed in other culture jars to start new colonies.

[2] Sodium chloride.

Wood Roach Parasites

Parasites of Adult or Nymphs. A red mite, *Pimeliaphilus podapolipophagus* Tragardh, will sometimes attack and destroy a culture of wood roaches. This parasite was also reported by Piquett and Fales (1952), as one which attacks cultures of American roaches, *Periplaneta americana* (Linn.). Fisk (1952) controlled mites in a culture of American roaches by dusting the interior of the culture jar with 5% Ovotran dust, and spraying the exterior with a 5% Ovotran spray. There was no apparent harm to the hosts.

Fig. 1. Two 5-gallon glass jars of the type used for culturing wood roaches. Each jar contains a plastic watering dish with a cotton wick.

Parasites of Egg Capsules. To gather additional information on the parasites of wood roach egg capsules, collections were made in Franklin, Delaware, and Allen Counties, Ohio, during 1951–52. The capsules were sorted readily into two sizes. The larger capsules, some 296 in number, are believed

to be those of *Parcoblatta pensylvanica* and the smaller capsules, 24 of them, are probably those of *Parcoblatta virginica.*

Almost 13% of the egg capsules collected under natural conditions showed evidence of previous parasite emergence. The normal roach capsules from which the roach nymphs have emerged can be separated in the following way from the capsules which have had parasites emerged from them.

Roach nymphs emerge from the egg capsule by crawling out between the loosened edges of the seam which runs along one side of the capsule. The empty egg pockets are left as a dry lattice inside the capsule. Lawson (1949) states that the pressure of the expanding nymphs in the hatching capsule ruptures the seam at first in the central portion but later along its entire length. The two halves of the seam are lifted back, the egg shells are broken dorsally at the same time, and the heads of the nymphs extend into the space thus opened.

The parasites emerge from the capsule by chewing a hole through the wall. The edges of the seam remain together. The parasite exit holes vary in size from some as small as a pin prick for *Syntomosphyrum blattae* Burks to others as large as 2.0 mm. in diameter for *Hyptia thoracica* (Blanchard). The species of *Hyptia* make a single exit hole. *Systellogaster ovivora* Gahan and *Syntomosphyrum blattae* Burks sometimes make two or three openings at different places on the same capsule. After the parasites have emerged the capsule is empty except for a small amount of loose debris.

The collected oothecae were incubated in glass tumblers covered with white organdy held in place by a rubber band. As the parasites emerged from the egg capsules they were collected and preserved in vials of alcohol.

For identification, these parasites were sent to C. F. W. Muesebeck of the Division of Insect Identification, Bureau of Entomology and Plant Quarantine. The determinations of the Evaniidae were made by Luella M. Walkley and the other Hymenoptera by B. D. Burks.

A total of 906 parasitic Hymenoptera was obtained. Evaniidae emerged from nine egg capsules, one individual from

each capsule. These evaniids were identified as five *Hyptia harpyoides* Bradley which emerged from the small capsules, and four *Hyptia thoracica* (Blanchard) from the large egg capsules. The remaining parasites emerged in large numbers from other parasitized oothecae; 200 specimens from 2 egg capsules were identified as *Tetrastichus hagenowii* (Ratz.), and 328 specimens from 12 capsules as *Systellogaster ovivora* Gahan. An additional 369 specimens of *Syntomosphyrum blattae* Burks emerged from 5 capsules.

TABLE I. Parasitism of Wood Roach Egg Capsules collected in Franklin, Delaware, and Allen Counties, Ohio, during 1951 and 1952

Date Collected	Egg Capsules Collected	Capsules Parasitized by Evaniidae	Capsules Parasitized by Other Parasites	Capsules Showing Previous Emergence
8–8–51	16	2	0	1
10–28–51	5	1	0	1
12–1–51	11	2	3	1
1–15–52	26	0	1	4
3–20–52	148	2	4	22
3–30–52	48	0	5	4
4–27–52	48	0	5	6
5–16–52	18	2	1	4
Total	320	9	19	43

A study of the accumulated data on parasite emergence (Table I) for all capsules of all sizes shows that 8.7% of the capsules collected during 1951–52 were parasitized. The evaniids alone parasitized 2.8% of the wood roach oothecae.

Acknowledgments are made to Dr. Carl Venard, Dr. Alvah Peterson, and Dr. Donald J. Borror of the Department of Zoology and Entomology, of The Ohio State University for their assistance in this study; also to Leslie D. Beadle, Sanitarian, U. S. Public Health Service, for his aid.

SUMMARY

Wood roaches collected from their natural habitats can be cultured in large glass battery jars provisioned with pellet-type dog biscuits, a constant water supply, and a resting place made of

bark. The roaches thrive best at temperatures of from 70° to 80° F., and relative humidity of approximately 75%.

Parasites emerged from 28 of 320 wood roach egg capsules collected in the field during 1951–52. The parasites were identified as *Hyptia harpyoides, Hyptia thoracica, Systellogaster ovivora,* and *Syntomosphyrum blattae. Tetrastichus hagenowii* known previously only from domestic roaches was reared from wood roach capsules. A mite, *Pimeliaphilus podapolipophagus* was found attacking adult and nymphal roaches.

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The Occurrence of Anax longipes Hagen in Mississippi (Odonata: Aeshnidae).

By George H. Bick, Tulane University,
New Orleans, Louisiana

Davis (1914) recorded a number of examples of *longipes* from Pass Christian, Mississippi, collected by Mr. and Mrs. F. F. Hunt in the month of March. Wright (1939) stated that

he "has collected in the vicinity of Pass Christian and other localities of like nature in the Central Gulf Coast, but has neither seen nor heard of any other collection of this species." In my (1950) *Dragonflies of Mississippi* I repeated the information given by Davis and by Wright and stated that all material seen from the Pass Christian area was *Anax junius*. *Longipes* was not included in Westfall's (1952) *Additions*.

I was therefore impressed when a single adult male of *longipes* from Mississippi was found in the Tulane University Collection. The specimen was collected at Lucedale (George County) on June 9, 1949, by Dr. George H. Penn and Mr. E. N. Lambremont. Lucedale is 60 miles northeast of Pass Christian and 35 miles due north of the Gulf.

The addition of *longipes* to the Mississippi list brings the total Anisoptera recorded from the State to 74.

I have always thought that *longipes* was rare in the United States. Indeed, Hine (1913) stated, "It does not appear that more than a score of specimens are in the collections of the world." I, therefore, became interested in checking its U. S. distribution and was surprised to learn that there are in the literature several records of its occurrence in each of the following states: Massachusetts, New York, New Jersey, Pennsylvania, Maryland, North Carolina, South Carolina, Georgia, Florida, Ohio.[1] It appears that *longipes* is fairly widespread in eastern U. S. Its presence along the Atlantic Coast from Massachusetts to Florida seems quite certain, and the Ohio and the Mississippi records indicate that it is probably present throughout the Eastern United States.

I was even more surpised to learn that several workers have considered it locally abundant. Gray (1937) found it surprisingly common in the Woods Hole Region of Massachusetts and Davis (1914) stated that it was not uncommon at least during some years on Long Island, New York. Beatty (1945, 1946) found it abundant on some days, and sometimes far exceeding *junius* in point of numbers at Upton, New Jersey,

[1] I do not think it practical to list the 32 citations which were accumulated to support these state records.

Davis and Fluno (1938) recorded it as fairly common at Winter Park, Florida.

However, records of the nymphs are still quite scanty. Calvert (1934) recorded two male exuviae from Primos, Pennsylvania, and seven female exuviae from Enterprise, Florida. Byers (1934) recorded nine nymphs "probably *longipes*" from Alachua County, Florida. Gray (1937) stated that one nymph from Woods Hole, Massachusetts, transformed in the laboratory but that an association of the adult with a specific exuvium was impossible.

Because records of the adults indicate a widespread distribution and because *longipes* is apparently common in some areas, aquatic biologists in Eastern U. S. should be cautioned not to assume that all *Anax* nymphs are *junius* and to utilize the key given by Calvert (1934) before reaching a decision.

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Bick, G. H. 1950. The dragonflies of Mississippi. Amer. Mid. Nat. 43(1): 66–78.

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Davis, W. T. 1914. The dragonfly *Anax longipes* on Long Island, N. Y. Bull. Brook. Ent. Soc. 9(2): 34–37.

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Collection Records of Some Arizona Mosquitoes (Diptera: Culicidae)

By Daniel R. Murphy, Arizona Desert Trailside Museum, Tucson, Arizona

Mosquitoes are constantly becoming more important to public health because of the increasing number of diseases known to be transmitted by them. When attacking this problem in a given region one must first ascertain which species occur in the area. Although huge sections of Arizona have been entirely neglected, collection records are available for a few superficially investigated localities. The present paper records the distributional data of the mosquitoes in the principal insect collections in the state. This list is offered as a base upon which to build and should stimulate further work on the mosquitoes of Arizona.

Thanks are due Major Carl R. Bruck, Sixth Army Area Medical Laboratory, Fort Baker, California and Mr. Edward L. Breazeale, Assistant Agricultural Chemist, University of Arizona, Tucson, Arizona for first interesting the author in this project. The late Dr. L. P. Wehrle of the University of Arizona gathered together, over a period of twenty years, most of the mosquito specimens in the collection of the University. His keen interest in the insects of Arizona and recognition of the great importance of this group accounts for approximately 78% of the specimens recorded in the present list. Dr. Alan Stone, United States National Museum, is acknowledged for his determinations on most of the material. The author is grateful to Mr. O. L. Barnes, Miss K. Bartlett, Dr. L. A. Carruth, Mr. F. C. Deaver, and Dr. D. C. Lowrie for permission to examine the various collections.

Scheme of the present list:

The mosquito tribes and genera are arranged according to the system used by Matheson;[1] the species are placed alpabetically within their respective genera. The collections for each species are arranged alphabetically by localities. Collections for each

[1] Matheson, Robert—"Handbook of Mosquitoes of North America"—1940.

locality are listed by dates of collection beginning with those collected in January and working on through December; no arrangement by years has been attempted because the material is too scanty. Following the date of collection is the number and stage of development of the specimens at hand; this is followed by the collector, the person responsible for the determination,[2] and lastly the collection in which the specimen is housed.[3]

A list of abbreviations used will be found below.

Abbreviations:

Collectors

aan	A. A. Nichols	ls	Louis Schellbach
cc	C. Calhoun	ob	O. Bryant
ctv	C. T. Vorhies	raf	R. A. Flock
egd	E. G. Davis	rbs	R. B. Streets
ewg	E. W. Gurnett	rh	R. Hobbs
fcj	F. C. Jones	rsb	R. S. Beal
fww	F. W. Williams	slg	S. L. Green
gwm	G. W. Marx	tb	J. R. de la Torre-Bueno
hbh	H. B. Harding	tkr	T. K. Ryan
lpw	L. P. Wehrle	wn	W. Noon

Determinations

(THGA)	T. H. G. Aitken	(LPW)	L. P. Wehrle

Collections

(B)	Barnes, U. S. D. A., Tempe, Arizona
(DM)	Daniel R. Murphy, Tucson, Arizona
(FSC)	Arizona State College, Flagstaff, Arizona
(GC)	Grand Canyon National Park, Arizona
(MNA)	Museum of Northern Arizona, Flagstaff, Arizona

The specimens in the collection of the University of Arizona make up the bulk of the list and to avoid unnecessary repetition are not marked.

[2] Most of the determinations were made or checked by Dr. Alan Stone of the United States National Museum; to avoid unnecessary repetition indication of the determiner will be found only on those specimens not determined by Dr. Stone.

[3] Since most of the specimens in the present paper are in the collection of the University of Arizona only those specimens housed in other collections have the collection indicated.

Miscellaneous

A	adult(s)
L	larva(e)
LR	collected as larva and reared
P	pupa(e)
PR	collected as pupa and reared
R	reared specimens, collection stage unknown
spm	specimen(s)

Dates of Collection

Roman numerals indicate months; arabic numerals indicate days of the month and years.

Genus ANOPHELES Meigen

Anopheles franciscanus McCracken, Ent. News 15: 12. 1904.

ARIVACA VI–17–34, 1 spm, lpw; NOGALES VI–8–39, 3 spm, wn; RUBY VII–10–38, 3 LR spm, gwm; SANTA CATALINA MOUNTAINS (Bear Canyon) X–25–38, 7 LR spm. lpw; XI–8–34, 9 R spm, lpw; XI–10–36, 2 R spm, lpw; XI–25–34, 7 LR spm, lpw; TUCSON III–35, 1 L spm, tb; IV–22–33, 1 spm, lpw; VI–7–21, 2 spm, aan; VI–7–32, 1 spm, lpw.

Anopheles pseudopunctipennis Theobald, Mon. Culic. 2: 305. 1901.

NOGALES VI–8–39, 5 spm, wn; TEMPE I–30–34, 1 spm, egd (B); XII–20–33, 1 spm, egd (B); XII–22–34, 1 spm, egd (B); XII–26–33, 1 spm, egd (B).

Anopheles quadrimaculatus Say, in Keating, Narr. Exp. St. Peter's River 2: 356. 1824.

ARIVACA VI–17–34, 4 R spm, lpw; VI–26–33, 1 spm, egd (B); VII–4–33, 1 spm, egd (B).

Genus AEDES Meigen

Aedes aegypti (Linnaeus), Hass. Pal. Reise: 470. 1762.

TUCSON I–8–42, 10 R spm, ctv;[4] I–12–42, 5 LR spm, ctv;[4] I–17–42, 3 LR spm, ctv;[4] II–4–42, 3 LR spm, ctv;[4] II–27–38, 1 spm, hbh; III–2–38, 1 spm, lpw; III–4–38, 2 spm, hbh; III–26–36, 1 spm, lpw; VIII–17–35, 1 spm, lpw; IX–3–36, 1 spm,

[4] These specimens were collected as larvae and pupae in a bowl of water containing sweet potato plants in the house.

lpw; IX–8–35, 1 spm, lpw; IX–10–36, 1 spm, lpw; IX–22–36, 1 spm, lpw; X–1–36, 1 spm, lpw; X–4–31, 1 spm, lpw; X–7–39, 1 spm, lpw; X–12–31, 1 spm, lpw; X–13–36, 1 spm, lpw; X–15–41, 1 spm, lpw; X–18–40, 1 spm, lpw; X–21–43, 1 spm, lpw; X–26–34, 1 spm, lpw; X–30–31, 1 spm, lpw (B); X–39, 5 spm, fww; XI–3–31, 1 spm, lpw; XI–6–41, 1 spm, lpw; XII–26–41, 2 R spm, lpw; XII–31–36, 1 spm, lpw.

Aedes purpureipes Aitken, Pan-Pacific Ent. 17: 82. 1941.

TUCSON VII–27–32, 1 spm, lpw.

Aedes varipalpus (Coquillett), Can. Ent. 34: 292. 1902.

CHIRICAHUA MOUNTAINS VI–17–37, 1 spm, rsb; MOUNT GRAHAM VII–4–40, 1 spm, slg; SANTA RITA MOUNTAINS X–20–40, 1 spm, raf.

Aedes vexans (Meigen), Syst. Beschr. Zweifl. Ins. 6: 241. 1820.

SOMERTON VI–8–39, 4 spm, lpw; VIII–8–39, 1 spm, lpw; VIII–20–38, 7 spm, lpw; TUCSON VI–7–37, 3 spm, tkr; YUMA X–24–40, 1 spm, lpw.

Aedes sp.

YUMA VI–5–41, 1 spm, lpw.

Genus CULEX Linnaeus

Culex apicalis Adams, Kans. Univ. Sci. Bull. 2: 26. 1903.

SANTA CATALINA MOUNTAINS III–27–30, 1 spm, lpw; (Sabino Canyon) III–14–33, 1 spm, egd (B); IV–14–33, 1 spm, egd (B); TUCSON IV–14–33, 1 spm, egd (B).

Culex arizonensis Bohart, Ann. Ent. Soc. Amer. 41 (3): 341. 1948.

SANTA CATALINA MOUNTAINS XI–8–34, 1 R spm, lpw.

Culex coronata Dyar & Knab, Jour. N. Y. Ent. Soc. 14: 215. 1906.

ARIVACA VI–17–34, 1 R spm, lpw; SANTA CATALINA MOUNTAINS III–27–30, 1 R spm, lpw.

Culex quinquefasciatus Say, Jour. Acad. Nat. Sci. Phil. 3: 10. 1823.

ARIVACA VI–17–34, 1 R spm, lpw; TEMPE I–30–34, 1 spm, egd (B); I–31–34, 1 spm, egd (B); II–6–34, 1 spm, egd (B); II–12–34, 1 spm, egd (B); IV–14–33, 1 spm, egd (B); XII–

18–33, 1 spm, egd (B); XII–19–33, 1 spm, egd (B); TUCSON II–9–41, 1 spm, raf; II–13–41, 1 spm, raf; V–2–42, 1 spm, lpw; V–15–40, 1 R spm, aan; V–30–31, 1 spm, lpw; VI–8–31, 9 R spm, lpw;[5] VI–9–31, 9 R spm, lpw;[5] VI–10–31, 19 R spm, lpw;[5] VI–11–31, 8 R spm, lpw;[5] VI–12–31, 18 R spm, lpw;[5] VI–17–42, 1 spm, lpw; VI–18–41, 2 spm, lpw; VI–21–44, 1 spm, fcj; VII–1–20, 4 spm; VIII–8–51, 5 spm, rh (DM); VIII–16–35, 1 spm, lpw; VIII–19–35, 2 spm, lpw; VIII–35, 2 spm, lpw; IX–35, 2 R spm, lpw; X–4–44, 2 spm, ewg; X–17–31, 1 spm, lpw; X–18–31, 2 spm, lpw; X–22–33, 1 spm, lpw.

Culex stigmatosoma Dyar, Proc. U. S. Nat. Mus. 32: 123. 1907.

NOGALES VII–15–40, 3 spm, (THGA) lpw; TUCSON II–9–41, 1 spm, raf; VII–1–20, 2 spm; IX–35, 2 R spm, lpw; X–2–34, 1 spm, cc.

Culex tarsalis Coquillett, Can. Ent. 28: 43. 1896.

ARIVACA III–21–33, 1 R spm, lpw; VI–17–34, 1 spm, lpw; BENSON IV–15–41, 1 spm, raf; FLAGSTAFF VIII–23–43, 1 spm, rsb (FSC); TEMPE I–31–34, 1 spm, egd (B); II–6–33, 1 spm, egd (B); II–12–33, 1 spm, egd (B); IV–19–33, 1 spm, egd (B); XI–14–33, 1 spm, egd (B); TUCSON I–24–31, 1 spm, lpw; III–22–43, 1 spm, lpw; IV–16–42, 1 P spm, lpw; VI–17–33, 1 spm, lpw; VII–1–20, 1 spm.

Culex spp.

NOGALES VI–8–39, 2 R spm, (LPW) wn; TEMPE II–9–34, 2 spm, egd (B); TUCSON III–35, 6 L spm & 2 P spm, tb; V–24–32, 6 L spm & 65 A spm, ctv.[6]

Genus CULISETA Felt

Culiseta impatiens (Walker), List Dipt. British Mus. 1: 5. 1848.

FLAGSTAFF VII–6–49, 4 spm, (MNA).

Culiseta incidens (Thomson), Kongl. Sven. Eug. Resa, 6 Dipt.: 433. 1868.

FLAGSTAFF VII–5–49, 2 A spm & 17 L spm, (MNA); VII–6–49, 4 spm, (MNA); GRAND CANYON (North Rim) VII–10–38, 1 spm, ls (GC); VII–11–38, 1 spm, ls (GC); (Grand

[5] These specimens were all reared by Dr. L. P. Wehrle and probably represent one collection with dates of emergence.

[6] Dr. Alan Stone states that these are probably *Culex tarsalis* Coquillett; the larvae are very small and the adults are badly rubbed.

Canyon Village) VIII–29–46, 1 spm, Sturm (GC); IX–14–46, 1 spm, Sturm (GC); NOGALES V–39, 1 spm, gwm; PRESCOTT VII–19–46, 2 spm, rsb (FSC); SANTA CATALINA MOUNTAINS I–5–35, 4 spm, ob; III–4–30, 6 R spm, lpw; III–15–30, 1 R spm, lpw; SANTA RITA MOUNTAINS VII–1–36, 2 spm, raf; TEMPE I–20–34, 1 spm, egd (B); II–6–34, 1 spm, egd (B); IV–14–33, 1 spm, egd (B); TUCSON I–5–35, 2 spm, lpw; I–7–47, 1 spm, lpw; II–13–41, 3 spm, raf; II–26–40, 1 spm, lpw; III–17–17, 2 spm; IV–16–42, 2 PR spm, lpw; V–15–40, 2 R spm, aan; VII–1–20, 2 spm; XII–13–41, 1 spm, lpw; WHITE MOUNTAINS VII–28–26, 1 spm, rbs.

Culiseta inornata (Williston), U. S. D. A. Div. Ornith. & Mam., N. Amer. Fauna 7: 253. 1893.

ARIVACA III–21–33, 7 R spm, lpw; III–24–33, 1 spm, lpw; SANTA CATALINA MOUNTAINS (Bear Canyon) III–18–39, 1 spm, tb; TEMPE XII–13–33, 8 spm, egd (B); TUCSON VII–1–20, 1 spm; XII–21–46, 1 spm, lpw.

Culiseta melanura (Coquillett), Jour. N. Y. Ent. Soc. 10: 193. 1902.

TEMPE II–9–34, 8 spm, egd (B).

Culiseta sp.

TUCSON III–35, 2 P spm, tb.

Genus PSOROPHORA Robineau-Desvoidy

Psorophora confinnis (Lynch Arribalzaga), Rev. Mus. de la Plata 2: 149. 1891.

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Psorophora signipennis (Coquillett), Proc. Ent. Soc. Wash. 6: 167. 1904.

TUCSON VIII–6–36, 1 spm, lpw; IX–11–38, 1 spm. lpw.

Notes and News in Entomology

Under this heading we present, from time to time, notes, news, and comments. Contributions from readers are earnestly solicited and will be acknowledged when used.

A Monograph of the Orthoptera of North America

The National Science Foundation has made a grant to JAMES A. G. REHN, Curator of Insects of the Academy of Natural

Sciences of Philadelphia, as the Principal Investigator, in support of the preparation of a monograph of the Orthoptera of North America. The grant covers a period of two years. This project has for a number of years been the chief long-range objective of the Department of Insects of the Academy, and toward it were directed the many seasons of field work of the recipient and his long-time colleague, the late Morgan Hebard. One half of Mr. Rehn's official time is to be allotted to the North American monograph, while the other half is assigned to his study of similar type on the Acridoidea of Australia, being prepared for and published by the Commonwealth Scientific and Industrial Research Organization of Australia, two volumes of which have already appeared. Direct preparatory work on the North American study will occupy approximately the first half year, which will be followed by the critical study of the acridoids. It is estimated completion of the work as outlined will require between eight and ten years.

The Nabours Collection of Genetic Material of the Tetrigidae (Orthoptera)

The Academy of Natural Sciences of Philadelphia has received as a gift the very extensive and important genetic material which resulted from the long-continued breeding experiments with grouse-locusts (Tetrigidae), carried on through a number of decades by Dr. Robert K. Nabours, Emeritus Professor of Zoology at Kansas State College at Manhattan, Kansas. This material formed the concrete evidence on which were based numerous outstanding contributions by Dr. Nabours and his associates on the inheritance of color pattern in these interesting grasshoppers, and constitutes the greatest set of controlled genetic breedings ever carried out with Orthoptera, and from these experiments entomology, broad biology and genetics per se have drawn important evidence and conclusions.

The Nabours series is preserved in sealed vials of alcohol, all data fully noted both in the vial and in accompanying records.

The number of individual vials, each containing a specific and recorded mating progeny, is in excess of 40,000, and that of individual specimens in the same between 460,000 and 500,000. —JAMES A. G. REHN.

Current Entomological Literature

Compiled by VENIA T. PHILLIPS, Librarian

Academy of Natural Sciences of Philadelphia

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania pertaining to entomology, including all arthropods except Crustacea. Coverage will be world-wide as regards major contributions to systematics as well as for all papers on morphology, physiology, embryology, etc. In addition, for species from the Americas and the Pacific (Nearctic, Neotropical and Polynesian regions) all minor contributions to taxonomy, distribution, etc., will also be recorded.

This list gives references of the year 1953 unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

For other records of general literature and for economic literature, see the Bibliography of Agriculture, Washington, and the Review of Applied Entomology, Series A, London. For records of papers on medical entomology see Review of Applied Entomology, Series B.

NOTE: The figures within brackets [ ] refer to the journal in which the paper appeared, as numbered in the List of periodicals and serials published in our January and June issues. The number of the volume, and in some cases, the part, heft, &c. is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

Papers published in ENTOMOLOGICAL NEWS are not listed.

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breeding rooms. [40] 44: 367–69, ill. **Klock, J. W. and W. L. Bidlingmayer.**—An adult mosquito sampler. [92] 13: 157–58, ill. **Kusnezov, N.**—Las formas de vida especializadas y su desarrollo en diferentes partes del mundo (Formicidae). [48] 4: 85–102. **Schwenke, W.**—Biozönotik und angewandte Entomologie. (Ein Beitrag zur Klärung der Situation der Biozöbotik und zur Schaffung einer biozönotischen Entomologie.) [28] 3, sonderheft: 86–162. **Sellers, W. F.**—A critique on the time factor in biological control. [40] 44: 273–89. **Sevastopulo, D. G.**—The handling of "papered" insects. [Ent. Record] 65: 197–99. **Smith, P. S.**—Wind currents and flying insects. [Ent. Record] 64: 49–50, 1952. **Tonks, N. V.**—Annotated list of insects and mites collected on brambles in the lower Fraser Valley, British Columbia, 1951. [53] 49: 27–9.

BIOGRAPHIES, OBITUARIES—Hyslop, James Augustus, 1884–1953.—Obituary notice with biography and portrait, by Helen Sollers, Fred C. Bishop and M. D. Leonard. [56] 55: 153–56. **Naufock, Rudolf,** 1880–1952.—Nachruf by K. Mecenovic. [Zeit. Wiener Ent. Ges.] 37: 208, 1952. **Pittioni, Bruno,** 1906–1952.—Obituary notice signed R. [Zeit. Wiener Ent. Ges.] 37: 186, 1952. **Riley, William Albert.**—Short biography, with port. [80] 39: 465–66. **Sachtleben, Hans,** 1893– . Hans Sachtleben zum 60. Geburtstage, port. [28] 3, sonderheft: i–ii. **Singh, Sardar Mohan,** 1910–1952. Obituary with port, signed M. V. V. [Indian Jour. Ent.] 15: 77–78.

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—Absence of a Lansing effect in Drosophila subobscura. [98] 172, no. 4367: 83–4. **Connell, J. U. and G. D. G. Jones.** —Observations on the entry of dusts into the respiratory system of the adult worker honey bee, Apis mellifera L. [40] 44: 291–98, ill. **Eisner, T.**—The histology of a sense organ in the labial palps of Neuroptera. [79] 93: 109–21, ill. **Grandori, L. and E. Carè.**—I corpi faringei (= Corpora cardiaca) in Calliphora erythrocephala Mg. adulta. [Boll. Zool. Agr. e Bach.] 19: 3–10, ill. **Hadaway, A. B. and F. Barlow.**—Studies on aqueous suspensions of insecticides. IV. Behaviour of mosquitos in contact with insecticidal deposits. [40] 44: 255–71. **Hayes, R. O.**—Studies on the artificial insemination of the mosquito Aedes aegypti (Linnaeus). [92] 13: 145–52, ill. **House, V. L.**—The interaction of mutants affecting venation in Drosophila melanogaster. II. Additive and pattern effects of combination of hairless, engrailed and cubitus interruptus. [Genetics] 38: 309–27. **Hoyle, G.**—"Slow" and "fast" nerve fibres in locusts. [98] 172, no. 4369: 165. **Hughes, T. E.**—The functional morphology of the mouth parts of the mite Anoetus sapromyzarum Dufour, 1839, compared with those of the more typical sarcoptiformes (Anoetidae). [Proc. K. Ned. Akad. van Wetenschappen. Ser. C] 56: 278–87, ill. **Kullenberg, B.**—Some observations on scents among bees and wasps. [Ent. Tids.] 74: 1–7. **Kunze, E.**—Artunterschiede im Bau der Riesenchromosomen in der gattung Simulium Latr. [104] 4: 23–32, ill. **Lefevre, G., Jr., F. J. Ratty and G. D. Hanks.**—Frequency of notch mutations induced in normal, duplicated and inverted X-chromosomes of Drosophila melanogaster. [Genetics] 38: 345–59. **Lesse, H. de.**—Formules chromosomiques de Boloria aquilonaris Stichel, B. pales D. et Schiff., B. napaea Hoffm. et quelques autres Lepidoptères rhopalocères. [119] 14: 24–8, ill. **Loconti, J. D. and L. M. Roth.**—Composition of the odorous secretion of Tribolium castaneum. [52] 46: 281–89, ill. **Lu, K.-H. and J. K. Bodine.**—Changes in the distribution of phosphorus in the developing grasshopper (Melanoplus differentialis) embryo. [113] 26: 242–54. **Ludwig, D. and M. Wugmeister.**—Effects of starvation on the blood of Japanese beetle (Popillia japonica Newman) larvae. [113] 26: 254–59. **Maeki, K. and S. Makino.**—Chromosome numbers of some Japanese Rhopalocera. [85] 7: 36–8. **Maelzer, D. A. and R. L. Kirk.**—A preliminary study of the genetics of DDT resistance in houseflies. [Austr. Jour. Biol. Sci.] 6: 244–56. **Masters, C. O.**—Seasonal succession

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Tuckerellidae. [52] 46: 243–58, ill. (*k). **Causey, N. B.**—On a Florida milliped, Siphonotus miamiensis n. sp. (Colobognatha: Polyzoniidae). [64] 36: 71–2, ill. **Chamberlin, R. V.**—Six new American millipeds, with notes on several cave-dwelling species. [31] 66: 67–72, ill. **Chickering, A. M.**—Two new species of Senoculus (Araneae, Senoculidae) from Panama. [11] 72: 281–87. **Gaud, J.**—Sarcoptidés plumicoles des oiseaux d'Afrique occidentale et centrale (Acarina). [Annales de Parasit.] 28: 193–226, ill. **Gregson, J. D.**—Records of the tick Otobius megnini (Duges) from British Columbia (Acarina: Argasidae). [53] 49: 30. **Goodnight, C. J. and M. L.**—Three new cosmetids (Arachnida: Opiliones) from western Mexico. [11] 72: 287–91, ill. **Hoffman, R. L. and R. E. Crabill, Jr.**—C. S. Rafinesque as the real father of American myriapodology: an analysis of his hitherto unrecognized species. [64] 36: 73–82. **Hughes, T. E.**—(See Anatomy.) **Husson, R. and R. Legendre.**—Sur la structure et la fonction des acini gnathocoxaux chez les Tegenaria (Araneide). [2] 237: 106–8, ill. **Lowrie, D. C.**—The orb-weaving spiders of the Chicago area (Argiopidae). [12] 49: 846–61 (k). **Summers, F. M.**—Bryobia curiosa, new species from the Mojave Desert in California (Acarina: Tetranychidae). [52] 46: 290–92, ill. **West, W. R., Jr.**—An anatomical study of the male reproductive system of a Virginia millipede. [79] 93: 123–75, ill.

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Reviews

ATLAS OF SCALE INSECTS OF NORTH AMERICA. Vol. VI, Pseudococcidae (Part II). By G. F. Ferris. Stanford University Press, Stanford, California, 1953. Pp. i–vi, 279–506, 85 full-page illustrations. Price, $7.50.

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EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

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Agapema galbina. Will exchange cocoons of this moth for nature books. E. Frizzell, Route 4, Box 96, San Benito, Texas.

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